again have primary filaments which follow a long course in the cytoplasm and secondary short filaments which take a transverse direction. Some of the long fibrils have a serpentine arrangement. In experimental anæmia and rabies and also in secondary lesions after injury of the peripheral nerves, the fibrils diminish in number, become of a pale diffuse brownish color with a fine granular appearance, or may show fusiform thickenings along their course. These pathological appearances vary according to the intensity of the injury or toxine, or the duration of any of the abnormal conditions.

The Psychological Bulletin. (Literary Section of the Psychological Review, June 15, 1904.)

This number of the Psychological Bulletin is a happy innovation; it is entirely devoted to psychiatry and neurology and is produced under the editorship of Dr. Adolf Meyer, who writes the first paper in the number, devoted to the exposition of modern clinical psychiatry, especially as exemplified by the evolution of the recent German schools, under the leadership of Kraeplin, Wernicke and Ziehen. The second paper is a review by Dr. August Hoch of psychological and physiological tests made in connection with the study of various mental diseases, both from the standpoint of research and diagnosis. The review of psychological literature that follows consists mainly of abstracts of recent important books and papers bearing on neurology and psychiatry. Among these are the recent volumes by Bethe and Nisal on the anatomy of the nervous system, the Archives of Neurology of the London County Asylums, and finally minute abstracts of Bleuler's case of one-sided occupation delirium in a general paralytic, and Liepmann's remarkable case of one-sided apraxia, which has recently come to autopsy. The other reviews relate principally to current German, French and Spanish literature and comprise such contributions as Köster, Saint-Paul, Berze, Klippel, Ramon y Cajal and Dejerine.

Der tic, sein wesen und seine Behandlung. Nebst eine vorrede von PROFESSOR BRISSAUD. DR. HENRY MEIGE und DR. E. FEINDEL. Deutsche Autorisierte Ausgabe von Dr. O. Giese. pp. i-xii, 1-398. Leipzig und Wien, 1903.

The mental and motor disturbance designated by the title of this book has long been of considerable interest to psychiatrists and practicing physicians. But its general characteristics, and especially the conditions and factors in its development should be of equal interest to the student of general psychology. The authors have been for a number of years special students of their subject, and have not only a thorough acquaintance with the work of their predecessors, but have themselves contributed more to it than any other two workers in the field.

Their object in the present book is (1) to present clinical material that is itself of interest, and (2) to differentiate clearly tic from the numerous other forms of motor disturbance. The scope of their data and discussions, however, is wider than this statement of their purpose. The clinical material is presented in the form of copious illustrations taken from the histories of cases. To this attaches, in the reviewer's judgment, fully half the interest and value of the book, but it cannot be presented in a brief review. A history of a case, the "prototype of a tic patient," constitutes an introductory chapter and gives a general picture of the characteristics of tic.

The following chapter outlines the results of predecessors. The

main deficiency in previous and current conceptions of tic lies in the misunderstanding of the relation of its motor and mental aspects. It is a psycho-motor phenomenon, but has been regarded as entirely psychic or entirely motor alone. Again, some who have not overlooked the motor aspect have included other motor processes, or have limited tic to its clonic form, excluding the tonic contractions that have all the other characteristics of it.

The nature of the motor process in tic is described in several following sections in connection with other motor processes, a special comparison being made between tic and spasm. The authors recognize two main forms of motor reactions. (1) The simple spinal reflex, with no co-ordination, and no systematic function. In the origin of this the will has no part, and can but seldom repress it. (2) The functional movements. These are co-ordinated, purposive movements, more or less automatically performed. Here belong (a) the movements of the vegetative functions, circulation, digestion, etc. (b) Movements that co-ordinate definite functions from birth onward in the origin of which the will does not participate, but over which it may develop an influence, *e. g.*, breathing, sucking, etc. (c) Movements which arrive at a complete co-ordination only after more or less learning, *e. g.*, walking, chewing. (d) Movements which originally attach themselves to ideas, but which through practice also develop the automatic character of the functional activity. Implicitly, the movement performed with voluntarily directed effort would constitute an intermediate class. The spinal or bulbular reflex movement is a spasm, if its stimulus has a pathological cause. Tic belongs to the second group, that of the functional movements. The functional movement involving voluntary muscles is a tic, if the motor reaction shows quite definite pathological signs.

The nature of the mental characteristics in tic are described mainly in connection with the consideration of the origin of the pathological motor process. Tic may take its origin in an external stimulus, in imitation, or in a centrally aroused idea. There may be the desire to avoid an unpleasant stimulus and hence the consequent movements, *e. g.*, turning of head to the side because of a rough-edged collar, winking because of dust particle under the eye-lid. Or there may be the desire to reproduce a certain stimulus, *e. g.*, pulling of a joint in order to hear it snap. A striking attitude or performance of another may be imitated because of its peculiarity. Finally, the idea of a certain movement and the impulse to perform it may be a pure product of the imagination. In any of these cases, and the special instances under each are varied and numerous, repetition makes the movement habitual. The original peripheral stimulus or centrally aroused idea is absent, but the performance of the movement continues without occasion or purpose, as an habitual automatic activity. In the development of this condition of the now pathological motor process a deficient will power is an essential and fundamental element. The tic patient has a weak will, and with it may go other traits characteristic of a partially arrested mental development. The development of the pathological phenomenon takes its own course because there is not the ability of voluntary resistance. This is one of the main things that distinguishes tic from the habitual, stereotyped performance of the normal person. The tic patient cannot check his habit, and further, he suffers through its repression. Also, the habitual movement of the normal person occurs unawares, when his attention is engaged in something else. Tic occurs when the mind and body are unoccupied. It weakens or disappears when the attention of the patient is directed to some other activity.

The localization of the tic is various. Any muscle of the body may be involved. The only rule to be noted is that those muscles that are used most, or are most expressive of mental states are most frequently the seat of this pathological activity. A single muscle alone is never involved, but only such groups as are used in co-ordinated functional movements. The authors devote a section to the description of different tics, naming them according to both the group of muscles involved, and the function of those muscles, such as the facial tics, or the mimetic tics, the lip tics, or the sucking tics, etc. Copious illustrations are given as usual. The form of the motor process may be that of either the clonic or tonic contraction. Other authors have not included the latter, but there are tonic contractions that have associated with them all the other characteristics of tic. There is no regular rhythm or frequency in the occurrence of the movements. They make their first appearance most frequently during childhood, but may begin at any other time of life, and usually continue up to old age. Several sections are devoted to the relation of tic to other diseases, differential diagnosis, other symptoms associated with tic, etc., that are of interest more to the clinician than to the psychologist.

The general outcome of these considerations is that tic is a unique psycho-motor phenomenon that may have various symptoms of other nervous disorders associated with it, but it bears no necessary relation to these. As to the etiology of tic nothing very definite is ventured. A variety of things may be the initiating occasion of what will later develop into a tic, but these cannot be regarded as causes. After these have been enumerated, the authors conclude that the psychic predisposition of the individual remains the *conditio sine qua non* for the origin and development of tic. The previous statement in regard to the weak will power, and partially arrested development of the tic patient is of course to be remembered in this connection. Some anatomical changes have been reported, but these the authors regard, not as characteristic of tic, but as results of complications of the cases reported. They regard tic as an inherited functional anomaly associated with a deficient development of cortical association tracts, or sub-cortical branchings, with molecular malformations that cannot be detected by present methods.

The last sixty pages of the book are devoted to a consideration of the treatment of tic. The degree of curability is, in general, dependent upon the degree of will power of the patient. Medicinal treatment is of little value. The rules of proper diet, and of general hygiene are to be observed. Proper psycho-motor training is the only direct method that can improve the condition of the tic patient. Two kinds of exercises are to be employed, together. (1) Exercises in remaining absolutely motionless, beginning with short periods that are to be gradually lengthened. (2) Regulated gymnastics, using only correct movements. Special stress is laid upon the use of the mirror. The patient is to perform these exercises also alone in front of a mirror, where he can himself see and correct his anomalies in positions and movements. Such a demonstration of his anomalies is more forceful than description or exhortation.

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Begaiement et Autres Maladies Fonctionelles de la Parole, by DR. CHERVIN. Sociètè d'Editions Scientifiques. Paris, 1901, pp. 551.

This is a revised and enlarged edition of the author's former work. The book is divided into four parts and an appendix. In part I he discusses the rôle of speech in society and classifies speech defects according to their causes. In part II he takes up stuttering proper giv-